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THE REVIVAL OF INDUSTRY IN FRANCE

BY RAOUL BLANCHARD

Exchange Professor at Harvard University

THE great war abounds in unexpected developments, and perhaps one of the most surprising is the impetus which it has given to manufacturing in France.

During the last fifty years, industrial life in France appeared to be sluggish. Industrial activity increased more slowly than in many other nations, especially Germany. The causes of this inferiority were numerous. France has been a wealthy agricultural country for ages, and this industry required labor which was diverted from manufacturing purposes. The raw materials were scarce. France produced no great quantities of ores, with the exception of the iron ore. Mineral fuel was lacking, since the production of coal before the war was only 40,000,000 tons, of which 30,000,000 were extracted from the coal fields of the North of France. There was also lack of textile fibers. Conditions for transportation were not very favorable; the ports were too numerous to be well-equipped; the system of canals for inland transportation was inadequate, except in North-Eastern France. Finally, business routine and antiquated administrative traditions hampered initiative and made success difficult.

These unsatisfactory conditions were aggravated during the first part of the war. The rich iron mines of Lorraine have been occupied by the Germans since the very beginning of the campaign. Soon after, the greatest part of the coal fields of the North fell into their hands, and at the same period, the railway lines were completely congested and monopolized by the military authorities. For a time, they served only to transport troops, ammunitions, war material and supplies. Then labor was reduced by three-quarters, by the call to the colors of all able workingmen from the age

of nineteen to forty-five. These facts concurred to produce, during the last five months of 1914, an almost complete stoppage of all industrial activities. Now, two years later, an activity and prosperity such as never before existed in France, has manifested itself. It is our purpose to study the causes and the result of this remarkable awakening, which has been effected under the most difficult conditions, and in the midst of the most terrific struggle in which France has ever been involved. Since it would be difficult to consider the whole of France, we shall choose, as an instance, one of the regions where this awakening is perhaps the most striking: South-Eastern France.

We understand by South-Eastern France, the mountainous country which stretches from Switzerland to the Mediterranean coast, on the left bank of the Rhone, the greater part of which is formed by the chains and valleys of the French Alps. The character of the country is varied, but of only moderate productive power. Manufacturing never developed in this region as in the north of France or in the vicinity of Lyons, because of the lack of mineral fuel, and the difficulties of transportation. Small factories were scattered here and there among the mountains, using what labor could be found, and the power of waterfalls for the transportation of raw material. Small coal mines were worked, which provided a supply sufficient for the heating of the houses in the neighboring towns of Lyons, Grenoble and Geneva, but inadequate to the demand of industry. The coal necessary for the factories had to be brought at high cost from other parts of the country, making it impossible to carry on manufacturing profitably.

To sum up the resources offered by these mountains for industrial purposes, they were chiefly mineral, vegetal and animal. And apart from these natural products was the potent power of wild streams.

Mineral industry made use of the rocks of the mountains. Limestone, which abounds in the sub-Alpine chains was transformed into lime in the neighborhood of Chambéry, Grenoble, Nice. Cement was manufactured from the rocks in which there was a proper proportion of lime and clay, and this was one of the most thriving trades of the country. It was the specialty of the Dauphiné, whence cement was exported to Italy and even to South America. Gypsum, abundant in the inner chains of the Alps, was made into plaster. In other

parts, slate-quarries were exploited, but for local needs only. Along the external border of the Alps an active trade in building stones was carried on with Geneva, Lyons and Marseilles. The output of metals was ever decreasing because of the want of proper transport. The ancient lead and silver mines had all been abandoned. The iron works which in former times had been thriving and busy places had been deserted one after another during the last twenty-five years. There remained in activity only a few forges at Allevard, and some metal plants at Grenoble and Annecy. The only ore whose extraction was remunerative was the bauxite, found in the department of the Var and used for the production of aluminum.

The utilization of vegetal products, however, did not bring in large profits. Timber had been once one of the chief resources of the forested parts of the Alps and was largely used for the needs of the French navy. But the deforesting was carried on so ruthlessly during the seventeenth and eighteenth centuries that it endangered the future of this section. Consequently, the forestry service had to enforce strict measures to restrain the export of timber. Only in the northern parts of the Alps are extensive and heavily timbered forests, which will supply lumber for manufacturing purposes. And in the large valleys are found the walnut trees, which are so valuable for cabinet ware and furniture. Paper manufacturing was perhaps the most prosperous industry, for fir and aspen abounded in the forests and the water-supply was at hand. Paper and card-board factories were numerous on the side of the mountain, and in the vicinity of Annecy and Grenoble were manufactured the finest qualities of paper for the Government bank notes and for use in art. But this industry was also limited by the transport question. The necessary imports of chemical fiber from Scandinavia were very expensive, and Paris, the chief market for paper, was far distant from these small centers of production.

Handicrafts such as silk manufacturing and leather dressing were more important. Formerly the raw materials were found in the country itself, but to-day the quantity of raw silk available in this district is insufficient, and the goats, sheep, and cattle of the mountains will not supply the needs of the leather business. Raw silk is brought from Italy or from the Orient; skins from every part of France, Algeria

and even Australia. The existence of skilled labor is the main explanation for the continuance of such trades in this part of the country. Silk manufacturing, which flourishes on the western border of the mountains, recruits its labor chiefly from the feminine population of the Bas-Dauphiné, these rural workers being more industrious and more easily satisfied than the inhabitants of large towns; nearly half of the French silk looms are distributed in the region between Grenoble and Lyons.

The skin manufacture consists chiefly in glove-making, and Grenoble is its center. This handiwork is delicate and artistic. The substitution of machinery for hand labor has not yet been possible. The skill of the handworkers, which is largely hereditary, is what has kept this industry thriving. The importance of the fabrication was great, since before the war it employed about 40,000 persons of which 10,000 were men and 30,000 women. The gloves were chiefly manufactured to export to England and America.

During the last score of years a new resource of the mountains has been utilized; that is, the power of the Alpine streams. Since the time of the great Piedmontese Minister Cavour, the name of "*houille blanche*" (white coal) has been used to designate the energy which flows down the side of the mountains from the melting glaciers. The transformation of this power into electricity, with its multiple applications, created a new industry. It meant not only the discovery of a new source of profits, but the increased output of all the other industries, paper-mills, spinning mills, weaving manufactures, etc., and the introduction of new ones, electro-metallurgy and electro-chemistry. In the same plant this manifold activity manufactures paper, forges iron, gives electric light for the towns and electric traction for the cars. The electric furnace can be used for the production of aluminum, for the refining of steel, or the making of explosives. The later technical development makes it possible to transmit power at a hundred kilometers or more from the generating power. During the last decade the force generated in the middle of the Alps has been brought to Lyons, and a hundred kilometers beyond. Marseilles purchases light and power from the stations of the Alps, and the project of transmitting power to Paris has been considered. This very modern and promising industry was considered, on the eve of the war, as one having the most brilliant of prospects.

The first effect of the war on these trades was almost a complete disorganization. Labor was suddenly taken away from the quarries, lime-kilns, cement works, paper-mills, iron-works. Every trade which was not connected with the production of war supply was considered as "*industrie de luxe*," and consequently glove-making and silk-manufacturing stopped. The electric plants which consumed no fuel and needed little labor went on, but they supplied scarcely anything except light and traction. The stoppage of work was so complete that the workingmen who were unfit to be mobilized remained unemployed, and the "*caisses de chômage*"¹ had to be instituted to help them. The paralysis lasted during all the months of August and September, 1914, and the revival of trade was very slow until the beginning of 1915.

However, it did not take a very long time to discover that this stoppage of all work was a tremendous mistake. The consumption of ammunition and war material is so great in modern battles, that even in the supposition of a short war the production of France was not adequate to the demand. That the war would be long began to appear inevitable to the most clear-sighted people during the winter of 1914-1915. It was necessary to set about the manufacture of arms, ammunition and war supply. The need was much more pressing as the coal and iron regions of France were for the greater part occupied by the enemy. On the other hand, this supposition of a war of considerable duration imposed upon the country the obligation of making the most of all its resources, since it needed still greater revenue to buy supplies in large quantities from foreign nations. The manufacturers had before them the task of resuming their industries and increasing their output.

The most pressing duty was of course the manufacture of products necessary for national defense. These are various, and the Southeast could produce a good many of them. Though the region is not supplied with material for heavy iron-works, and could not manufacture guns, it was at least possible to work on shells and grenades, to manufacture explosives, to prepare cotton for powder, to produce timber and cement for the trenches, stocks for rifles, and many other utilities. At the same time an attempt was made to restore

¹ Fund for the help of unemployed workmen.

the activities of paper-mills, and to give an impulse to glove-making and silk-manufacture.

The difficulties, as may well be understood, were enormous. Everything was lacking: labor, coal, raw material, and transportation services were utterly disorganized. Thus passed several anxious weeks. Little by little these problems were studied and solved with the help of a new administrative organization, the "*Sous-secrétariat d'Etat de l'Artillerie*," which became later the "*Ministère de l'Armement*." Each particular problem was solved by the most practical means, the power of the state being now a help and not a hindrance to private initiative.

The problem of labor was of course the most pressing and the most difficult to solve. Various schemes were devised to answer the needs of the moment. The first was to take men out of the army and send them to industrial work. This was done with great caution during the winter of 1914-15. The proportion of the men thus taken increased more and more during the year 1915, and reached its fullest extent in 1916. The specialists in steel work were the first to be taken out of the trenches; these were far from being sufficient, and common workmen were added to them. Then chemists and workmen trained in the manufacture of explosives were recalled; electric engineers were sent back to the hydro-electric plants; miners above 35 years of age who belonged to the territorial regiments were sent to the mines; paper-makers and cardboard-makers who could be employed in the preparation of explosives were put to work; cabinet-makers were put to manufacturing rifle-stocks; wood-cutters were brought back from the front in order to see that there was no waste in providing the enormous amount of wood needed in the army. All this recalling of mobilized men was effected at first according to the need, and without method. By degrees it became clear that the output would be greater if these soldiers-workmen were assigned to the plants or factories where they were working before the war. As it would have been unwise to take too large a number of men out of the fighting units, hundred of thousands were taken from the auxiliary troops of the interior, men who through lack of physical ability to fight were employed in sedentary tasks. Thus in 1915 and 1916, auxiliaries were swept away to become workmen, foremen, secretaries, book-keepers, accountants, etc. Finally, the administration decided to draw

from the oldest classes of men still under the military law. These were called in 1915 and sent to the factories; men born in 1868, either bachelors or married men without children.

Another draft was made on the civil population. To make up for the absence of male help, women were called upon for a great number of occupations. There is, in modern manufacturing, a good deal of work which requires no great physical strength, and where attention and skill are sufficient qualifications to run the machines. Women are adapted to such work. Attracted by high salaries, they applied for employment in mechanical plants, in gun-powder manufactories, in administrative offices; and to make it easier for them, directors of important firms organized in their factories day-nurseries (*crèches*). This introduction of masses of women into the industrial field is certainly one of the most important of the economical phenomena brought about by the war.

Along with women, the refugees were to do their part. In all the southern districts of France, there have existed since 1914, colonies of Belgians and of French people from the invaded regions of the north, who fled before the invaders, and settled there. Their number has increased by degrees, as the Germans from time to time have sent back to France destitute people and those who could live no longer so near the fighting line. After a rather long period of unsettled life, these refugees took again to regular occupations, some working in the fields as agricultural hands, others in factories. To-day, it is difficult to find unemployed people among them.

Finally, the alien population counts for much more than before the war. In the southeast Italians have always been numerous; in 1911 there were about 12,000 in the district of Grenoble alone. They are excellent workmen, sober and hard-working, and they rendered great service at the outset of the war. Unfortunately, the entrance of Italy into the European conflict brought with it a threat to have them all recalled to their own country. The French Government succeeded in obtaining permission for a great number of them to stay provisionally in France. This provisional arrangement, renewed month after month up to the middle of 1916, ended by granting to a great many workmen a temporary exemption of some length. Aside from these, the Spanish and the Portuguese had already appeared in the workyards of the south-east. The employers did their best to keep the first-comers

and to attract others. A newer element was provided by natives from the colonies. Thus, the Kabyles, from Algeria, sturdy workmen, whose emigration towards the North of France had already been organized during the years preceding the war, now furnished a useful quota. Some natives from Morocco, equally hardy, were added to them. Large numbers of Greeks and of Armenians came, and since 1916 the last touch has been added by the landing of Annanites and Chinese, who filled up whole factories. Each manufacturing center has thus become a cosmopolitan city, where people of different nationalities and races are rubbing elbows. But they do not live always in perfect harmony. During the Summer of 1916, at Lancey, near Grenoble, the Spanish and the Portuguese sought to expel the Greeks under the pretext that the conduct of King Constantine was a disgrace to their nation.

The last resource was the enemy itself. There are in France more than 250,000 German prisoners, engaged in various work and receiving a salary for it. The largest number are engaged in agricultural work, but a good many gave themselves willingly to manufacturing which was not directly connected with national defence. In the southeast they are building hydro-electric plants, working on the railway tracks or on the roads, or employed anywhere as ordinary workmen. To them must be added the contingent of Austrian prisoners brought back by the Serbians through Albania. These, being for the greatest part Slavs of Bohemia and Carniola, have no scruples about bringing help to France, and work with enthusiasm even for war trades. Well fed and well clad, all these prisoners are in perfect health, and they are well contented to get some remunerative occupation after having escaped from the hell of the firing line.

Thus, by these various means, the difficult problem of labor has been solved. The staff and hands of the old factories have been reconstituted; in many cases their number has considerably increased; also new firms have been created. At Grenoble a metal plant which occupied 700 persons before the war now has 3,000 employees. The plant at Lancey jumped from 800 to 2,000 employees; another very important one, at Ugines, from 1,000 to 3,300. The small borough of Chapareillan (near Chambéry), which had a workshop of five men before 1914, has now a big shell fac-

tory employing 1,000 workingmen. Instead of a dearth of workmen there is relative abundance almost everywhere. Their number has been doubled, sometimes trebled or quadrupled.

At the same time that these efforts were made great ingenuity was employed to procure fuel and raw material. It is fortunate for the industries of this region that they do not require much coal, for, being far from ports and mining districts, it would have been difficult to find the necessary supply. Only the metal works have great need of it, and they can procure a supply from Saint-Etienne or from the coal fields of the Gard. The Government took the precaution to give the army purveyors precedence over other buyers. The raw materials which the region itself could produce, such as wood and stone, could naturally be easily obtained. Raw silk from Italy, skins from other regions of France, were also easily obtainable. The great difficulty lay in the materials procurable only from foreign countries,—steel from England and Spain, copper from America, sulphur from Sicily, etc. In order to assure transportation for these products it became necessary to limit strictly the number of passenger trains. At present on most of the branch lines there is but one passenger train a day in each direction, and on the main lines but three or four. The restriction in train service has certainly been one of the most evident and annoying of the practical inconveniences caused by the war for people out of the war zone. Finally, the Government, aside from procuring laborers, facilitating transportation, and even placing contracts for raw materials, has taken an even more active part in the work. In some instances it has actually built the factory, equipped it, and set it in operation, as in the case of the great plant at Chapareillan. And very often the Government has given the manufacturers generous financial aid, lent them sufficient sums with which to enlarge and perfect their establishments, to set up new machinery, and even to construct new buildings. The energy and intelligence displayed in this matter by the *Ministère de l'Armement* have been notable and most praiseworthy.

RAOUL BLANCHARD.